

EXPLORING THE TIME COURSE OF STARING-INDUCED DISSOCIATION AND UNCERTAINTY ABOUT VISUAL PERCEPTION

R. Saric (3055922) & K. Turksma (0446939)

January, 2009

Master Thesis Clinical Psychology
Utrecht University

Mentor: Prof. dr. M. van den Hout

Abstract

Earlier studies found that perseverative checking provokes memory distrust for checked stimuli, suggesting that compulsive checking is a counterproductive strategy to increase memory confidence. Obsessive compulsive uncertainty also occurs for functions other than memory, like perception. A previous study on OC-like perseveration found that perseverative staring causes dissociation and uncertainty about perception. In the current study with eighty healthy volunteers it was tested when this phenomenon sets in. Five conditions that differed in duration of visual perseveration were compared. Analysis of Variance showed a significant increase between pre- and post-test for both uncertainty and dissociation. More importantly, the increases set in after a short period of visual perseveration. These findings indicate that increasing dissociation and uncertainty about perception is a rapid occurring phenomenon, and therefore not an artefact of laboratory studies.

Index

Summary	1
Introduction	3
Method	10
Pilot	10
Participants	13
Assessments	13
Procedure	15
Statistical Analysis	16
Results	17
Discussion	22
Acknowledgement	26
References	27
Appendix	30
A. Instructions	30
B. Questionnaires	34
C. SPSS Output	36

Introduction

Obsessive-compulsive disorder (OCD) is a chronic mental disorder characterized by the following components: a) obsessions or compulsions, b) at a given time in the course of the development of the disorder, the person is conscious of the fact that these obsessions and compulsions are irrational, c) obsessions and compulsions cause for a significant amount of distress, are time-consuming or a disturbance to a persons day-to-day life, their professional functioning or their social activities and relations with others (DSM-IV-TR, 2001). The disorder is most commonly characterized by obsessions and compulsions.

Checking is one of the most common types of compulsions in OCD patients. Because OCD patients report that they often feel uncertain about whether they have correctly completed an activity, they engage in repeatedly checking (Jenike, Baer & Minichiello, 1990). Interviews with OC patients suggest that memory distrust and checking are related: memory distrust is experienced as a motive for compulsive checking (Reed, 1985).

In 2003 De Cort, Eelen, Hermans, Martens en Pieters report that the confidence of patients with OCD with respect to their own memory (for actions) is diminished. Doubt about whether or not specific behaviours were (correctly) performed does not arise because the person does not remember whether or not an action was actually performed, this arises due to the fact that the person does not trust his own memory (for this action) or because the person does not trust his own ability to discriminate between memory traces of actual performances and memory traces of imagination concerning such performances. This shows that it is far from evident that the uncertainty in OCD checkers is caused by a memory deficit. These results emphasize the importance of trust in ones own memory, and suggesting that they do not suffer from a memory problem, but from a metamemory problem. The fact that OCD patients tend to be uncertain about memory performance are supported by several other studies (Brown, Kosslyn, Breitner, Baer & Jenike, 1995; Constance, Foa, Franklin & Matthews, 1995; Dar, 2004; Dar, Rish, Hermesh, Fux & Taub, 2000; Ecker & Engelkamp, 1995; Hermans, Engelen, Grouwels, Loos, Lemmens & Pieters, 2008;

Karadag, Oguzhanoglu, Ozdel, Atesci & Amuc, 2005; MacDonald, Antony, MacLeod & Richter, 1997; McNally & Kohlbeck, 1993; Sher, Frost & Otto, 1983; Tuna, Tekcan & Topçuoğlu, 2005; Zitterl et al., 2001).

Van den Hout and Kindt (2003, 2004) conducted a series of studies in order to test the mechanism responsible for decreased memory confidence more closely. It was presumed that checking increases the familiarity of the checked items. This increased familiarity inhibits bottom-up processing of the perceptual characteristics, which leads to decreased vividness and detailed memories. This results in diminished certainty of one's own memory. Hence, people who repeatedly perform checking behaviour are insecure about their own memory as a result of this repeatedly checking. This might lead to a spiral where checking leads to reduced memory confidence, which in turn leads to more checking. In addition, there was found that a shift arises in the memory source that is used to determine the outcome of their checking behaviours: from (specific) 'remembering' to (general) 'knowing'. Repeatedly checking leads to ambivalence: 'knowing' that you have a memory, but this memory is vague and unclear (Van den Hout et al., 2003, 2004).

Hence, the question addressed was why OCD checkers remain uncertain *despite* repeated checking. It was hypothesized that OCD checkers remain uncertain *as a result of* repeated checking. In one of these studies (Van den Hout & Kindt, 2003) participants were randomly assigned to either one of two conditions and were instructed to perform checking trials on a virtual gas stove (pre-test and post-test were equal). The experimental group performed relevant checking between pre-test and post-test (checking the virtual gas stove) whereas the control group performed irrelevant checking (checking virtual light bulbs). Results show that displaying OCD-like checking behaviour resulted in reduced vividness/detail of recollections and, while actual memory accuracy was unaffected by checking, repeated checking was sufficient to induce profound memory distrust. The hypothesized mechanism which states that the increased familiarity inhibits bottom-up processing of perceptual features rendering recollections less vivid and less detailed shows to be correct: "The more checking you do, the less confidence you have in your memory of the checking", Rachman (2002).

Radomsky, Gilchrist and Dussault (2006) replicated this study to investigate whether repeated checking really does cause memory distrust, and tried to improve the validity by adding aspects associated with responsibility and threat perception (using a real stove in a functioning kitchen). The results were consistent with the findings of Van den Hout & Kindt (2003, 2004). Radomsky et al. (2006) concluded that repeated relevant checking does indeed lead to memory distrust. Finally, Boschen and Vuksanovic (2007), were able to replicate the 'checking breeds doubt' effect in a clinical sample.

Coles, Radomsky and Horng (2006) presented the results of two studies in which they explored the boundaries of memory distrust from repeated checking. In the first study participants (N=50) were randomly assigned to one of two conditions: either to perform 0 or 15 checking trials (on a real and functioning gas stove) between pre- and post-test. Memory accuracy, confidence, detail and vividness were assessed. Memory source was assessed by asking the participants to indicate whether the source of their memory for the last checking trial was 'knowing' or 'remembering' that the gas stove was off. It was hypothesized that a high number of checks (15) would decrease memory confidence, vividness, and detail, and lead to greater reliance on 'knowing' as a source of memory compared to 'remembering'. It was also hypothesized that memory accuracy would not substantially decrease with repeated checking. The results indicate that repeated checking of a stove leads indeed to a significant decrease in memory confidence, vividness and detail. Memory accuracy did not significantly differ from the control group, and was therefore not affected by repeated checking. Repeated checking also has an affect on shifting the memory source from 'remembering' to 'knowing'. The aim for the second study (N=78) was to examine the threshold at which repeated checking negatively impacts memory confidence. Participants were randomly assigned to either one of 5 conditions (0, 2, 5, 10 or 15 checking trials). Memory confidence, accuracy, vividness and detail were assessed as well as memory source, which was assessed by asking whether the participants relied on 'knowing' or 'remembering' if the gas stove was off. Results indicate that there is a decrease in memory confidence, detail and vividness in the 10

and 15 checking trials conditions, and an increased reliance on 'knowing' versus 'remembering' as a memory source. These results suggest that the paradoxical consequences of repeated checking occur quicker than after the 20 trials as used in previous studies (Van den Hout & Kindt, 2003). Coles et al. (2006) suggest that the number of checks required to have an impact on memory confidence is most likely to be between two and ten checking trials, but an exact threshold remains elusive.

All previous studies exclusively focused on memory and memory confidence. Data from a clinical study by Hermans et al. (2003), however, indicated that cognitive distrust in OCD might also extend to attentional processes. Based on their previous findings Hermans et al. (2008) conducted a study to examine confidence in attention in a clinical sample of OCD patients more directly. In this study not only was the confidence about one's own memory addressed, but also with regards to perception and attention. Participants had to perform four actions in a row (a repeated actions task) and were afterwards asked to fill out questionnaires concerning metacognition and their levels of confidence in attention, memory and perception. Results showed that participants from the OCD group exhibited significantly less confidence in attention and memory as compared to the control groups. Interestingly, this effect was also present for the items that assessed confidence in perception. Again this points to the fact that cognitive distrust extends beyond memory. Hence, it is argued that research on metacognition in OCD should move beyond the study of memory and expand to assessing the distrust of perception and attention.

Several studies showed that perseveration leads to distrust (van den Hout & Kindt 2003, 2004; Radomsky et al., 2006; Coles et al., 2006; Boschen & Vuksanovich, 2007; Hermans et al., 2008). Uncertainty of OCD patient also relates to functions other than memory (Van den Hout, 2007; Nedeljkovic & Kyrios, 2007). Clinical observations for instance suggest that OCD patients may be uncertain about text comprehension or motor control. If OCD is not only characterised by distrust in memory but also by distrust in perception and attention, one might wonder whether we are not tapping

into a more general and pervasive characteristic of persons suffering from OCD. One might speculate that *memory distrust*, caused by *checking*, is a special case of an overarching pattern of *perseveration* leading to *distrust*. Thus uncertainty about visual perception may be responded by staring. Staring however, may have as direct result that the person becomes uncertain about the perception of the stared at object.

To further investigate distrust with regards to perception Van den Hout et al. (2008) conducted a study to verify whether perseveration of visual perception culminates in uncertainty about perception. Besides examining uncertainty in perception, the effects of visual perseveration on feelings of dissociation were examined as well. The American Psychiatric Association (1994) defined dissociation as “a disruption of the usually integrated functions of consciousness, identity or perception of the environment”. Fricke, Hand, Held, Cremer & Rufer (2006) noted that previous studies have indicated that OCD is associated with higher levels of dissociation (Baer, Bottolph, Goff, Jenike & Olin, 1992; Merckelbach & Wessel, 2000; Rufer et al., 2006). When Grabe et al. (1999) researched this phenomenological association more precisely, the results of their study showed that the dimensions ‘checking’ and ‘symmetry/ordering’ were significantly related to dissociative symptomatology. In an extending study, Fricke et al. (2006) found a significant link between the checking, symmetry/ordering, obsessive thoughts dimensions and dissociation in OCD as well, but only the checking rituals showed an independent association with dissociative symptoms. Moreover, it is suggested that prolonged staring at a non moving object can induce concurrent dissociation about the visually perceived object (Leonard, Telch & Harrington, 1999; Holmes, Brewin & Hennessy, 2004).

To investigate if perseveration of visual perception results in dissociation and leads to uncertainty about the prolonged visual perception, van den Hout et al. (2008) tested forty healthy participants, randomly assigned to one of four groups (4x N=10). The experiment had three phases: pre-test; perseveration; post-test. Participants had to look at an object (a gas stove or a light bulb) for ten seconds during pre-test and post-test. In between these tests, participants in the control condition were asked to stare at an object for the next ten minutes that was the same

as the to-be-looked-at object during the pre/post-tests. Participants in the control condition stared at an object that was different from the object they looked at during pre/post-test. Instructions stressed the importance of concentrating on the object while staring. Participants were asked to stare while not talking and blinking their eyes and to avert their gaze. The participants were sitting in front of a desk with a 2-ring gas stove and a lamp with two normal light bulbs. After pre-test and post-test participants had to fill out a questionnaire. Dissociation was measured with a translated version of the 19 self-rated items of the 'Clinician Administered Dissociative State Scale' (CADSS; Bremner et al., 1998; Holmes et al., 2004). Uncertainty was assessed with a self-composed scale of five items, which were factor-analysed to insure that they were loading on one component. The authors found that in both experimental and control condition dissociative feelings were increased; the effects were equally strong. With regards to OC-like perceptual uncertainty, the effects were significantly stronger in the experimental condition. These findings indicate that OC-like perseveration induces distrust, not only about memory, but also about perception. The findings add to earlier ones in which Coles (2006), Van den Hout en Kindt (2003a, 2003b) and Radomsky et al. (2006) found that perseverative *checking* leads to uncertainty in *memory*. Based on their study, Van den Hout et al. suggest that there may be a more general pattern: *perseveration* \Rightarrow *uncertainty*. With regards to dissociation the effects were not as expected. The fact that the feelings of dissociation increased equally strong in the experimental and control group were remarkable, since there was expected that by directing visual attention to a new object at post-test, dissociation would be interrupted. The results indicate that, for at least a short interval, perseverative visual attending induces dissociation that persists beyond the perseveration period. The fact that uncertainty, but not dissociation, was more strongly affected in the experimental group may be a result that is relating to the nature of the items involved in the two measures. While all five 'uncertainty' items explicitly referred to visual perception of the objects that individuals looked at, many of the CADSS items referred to other issues. The more general and less stimulus-bound nature of dissociation assessed with the CADSS may have made scores insensitive to a change in the perceived object.

Earlier studies found that one's confidence about perception and feelings of dissociation increase after a ten minute period of perseveration of visual perception (Hermans, 2008; Van den Hout et al., 2008). Although there is no controlled data regarding duration of staring by OCD patients, it may seem that a ten-minute period of continuous staring is extremely long. It is suggested by Van den Hout et al. (2008) that the staring paradigm may serve as a laboratory model of OCD visual perseveration. However, for the credibility of the model it is crucial to know how uncertainty and dissociation set in after staring is started.

Hence, the aim of the current study is to critically examine the time course of feelings of dissociation and uncertainty after perseveration of visual perception. It is hypothesized that the effects of perseverative staring on feelings of uncertainty and dissociation occur after less than ten minutes. To examine when precisely the effects occur, five groups with each a different staring period are created (in particular 0; 7,5; 15; 30; 300 seconds of perseverative staring). The duration of the intervals is based on extensive piloting (see below).

Methods

Pilot

A pilot study was conducted to measure the amount of time that was needed to find dissociation and an increase in feelings of uncertainty after perseveration. Participants (N=10) were asked to look at a gas stove for three seconds and, immediately afterwards, were asked to complete the questionnaire. After that, they were instructed to work on a word puzzle for the next 4 minutes and 50 seconds. When this time had past, the participants were asked to stare at the gas stove for the next 10 seconds. After 10 seconds they were asked to look at the gas stove once more and were asked to complete the same questionnaire with respect to the last view of the gas stove. The data was analyzed to determine the effect of perseveration on dissociation and uncertainty about perception (shown in Figure 1).

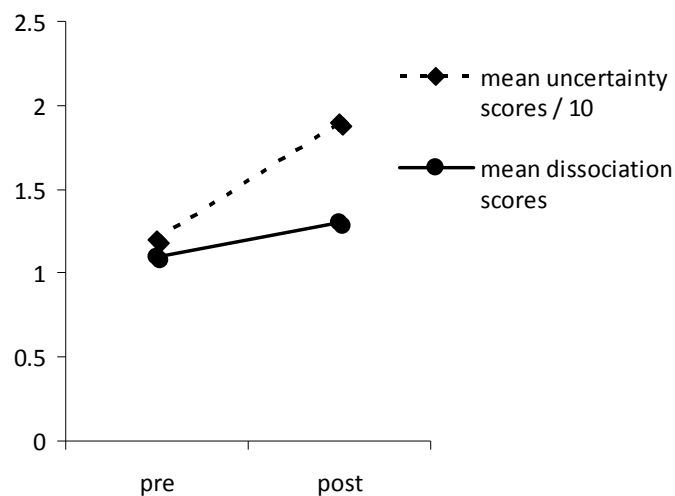


Figure 1. Mean dissociation scores and uncertainty scores of pre-test and post-test

These results show that there is a trend to feeling higher levels of dissociation and uncertainty after a ten seconds period of perseveration. Nevertheless, the effect does not seem to be very strong. Uncertainty scores for pre- and post-test were $M = 12.4$ (18.5) and $M = 19.1$ (22.8). In the case of the dissociation measure the mean scores at pre-test and post-test were $M = 1.1$ (0.3) and $M = 1.3$ (0.6). This is not a strong increase, compared to the mean scores at pre-test and post-test in the study of Van

den Hout et al. (2008), where the scores were $M = 1,3$ (1.0) at pre-test and $M = 4,9$ (1.90) at post-test after a ten-minutes period of perseveration (after their mean total scores are being modified to make comparison possible).

Based on these pilot findings it was decided to conduct a second pilot study to see whether the effects would be stronger after an amount of staring time ranging from 5 seconds to 15 seconds. Participants ($N=5$) were asked to look at a gas stove and, immediately afterwards, were asked to complete the questionnaire (trial 1). After that, they were instructed to work on a word puzzle for the next minute (filler task). When this time had past, the participants were asked to stare at the gas stove for the next 5 seconds. After that they were asked to complete the same questionnaire again (trial 2), followed by one minute of filler task, 10 seconds of staring, completing the questionnaire (trial 3), one minute filler task, 15 seconds of staring and again completing the questionnaire (trial 4).

The data of this pilot study was analyzed to determine the effect of perseveration on dissociation and uncertainty about perception. Mean scores were calculated for both dissociation and uncertainty after each trial, as shown in figure 2 and 3. Measurements after the different trials showed that, with regard to the dissociation scores, all participants had an increase in feelings of dissociation after trial 1, 2 and 3. After trial 4, three out of five people had continued this increase. The overall mean scores of these five participants showed an increase of feelings of dissociation after each trial (figure 2).

With regards to uncertainty, the measurements showed that four out of five participants experienced increased feelings of uncertainty after each trial. The fifth participant showed a small decrease after trial 3 (ten seconds of staring), but experienced increased feelings of uncertainty after the last trial again. Here too, the overall mean scores of this five people showed an increase of feelings of uncertainty after each trial (figure 3).

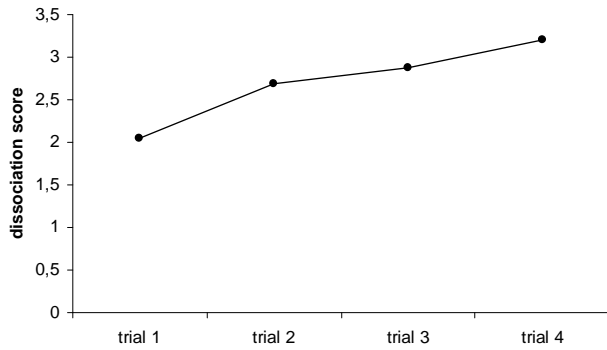


Figure 2. Mean dissociation scores after each trial (0, 5, 10, 15 seconds of staring).

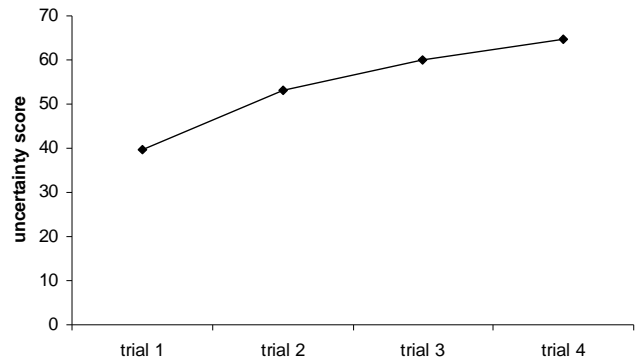


Figure 3. Mean uncertainty scores after each trial (0, 5, 10, 15 seconds of staring).

There was a significant effect of the trials with regard to dissociation [$F(1,4)=20.17$, $p<.05$, partial $\eta^2 = .83$]. A paired-samples t-test was conducted to evaluate the impact of increasing time periods of staring on experienced feelings of dissociation. There was a statistically significant increase in dissociation scores from trial 1 ($M=2.04$, $SD=0.83$) to trial 2 [$M=2.56$, $SD=0.90$, $t(4)=-2.98$, $p<0.05$]. There was also a significant increase from trial 2 ($M=2.56$, $SD=0.90$) to trial 3 [$M=2.88$, $SD=1.10$, $t(4)=-3.14$, $p < 0.05$]. There was no significant increase from trial 3 ($M=2.88$, $SD=1.10$) to trial 4 [$M=3.20$, $SD=1.01$, $t(4)=-1.73$, $p = 0.16$].

There was a significant effect of the trials with regard to uncertainty [$F(1,4)=11.11$, $p<.05$, partial $\eta^2=.74$]. A paired-samples t-test was also conducted to evaluate the impact of increasing time periods of staring on experienced feelings of uncertainty. There was no statistically significant increase in uncertainty scores from trial 1 ($M=39.6$, $SD=25.86$) to trial 2 [$M=53.12$, $SD=19.46$, $t(4)=-2.69$, $p=0.055$]. There was also no significant increase from trial 2 ($M=53.12$, $SD=19.46$) to trial 3 [$M=59.92$, $SD=9.89$, $t(4)=-1.34$, $p=0.25$]. There was a significant increase from trial 3 ($M=59.92$, $SD=9.89$) to trial 4 [$M=64.60$, $SD=12.45$, $t(4)=-3.35$, $p < 0.05$].

Based on these results the final design for the experiment was defined. The actual experiment uses five groups with different time periods of perseverance, respectively 0, 7,5, 15, 30 and 300 seconds of perseverance. No perseverance is used as a control condition; no increases between pre-test and post-test are expected here. 7,5 Seconds of perseverance is set because the results of the pilot study indicate that

dissociation scores increase even after a small period of five seconds of perseveration. Although uncertainty showed no significant increases here yet, a clear trend towards this can be seen. Because uncertainty scores increased significant after fifteen seconds of perseveration, this is set as the time of perseveration for group 3. A thirty seconds period of staring is set to further observe the process of increasing feelings of dissociation and uncertainty and a 300 seconds perseveration period is used as a control group, expecting the largest increases in this condition.

Participants

Eighty volunteer college students, studying at Utrecht University, of which fifteen male and 65 female, participated, the mean age was 22.3 (Sd = 4.2). Participants were paid a small remuneration or received credit points.

Assessments

Dissociation

Five items (item 2, 9, 10, 11, 18) were selected from the 19 subject-rated items from the Clinical Administrated Dissociative State Scale (Bremner et al., 1998). They are further referred as the Dissociative State Scale (DSS; Holmes et al., 2004). These items were used and translated in Dutch in the experiment of Van den Hout et al. (2008). Items were rated on a 5-point scale anchored with 1 (not at all) and 5 (extremely). The items were selected from the 19 subject-rated items, based on their relevance of object dissociation and highest correlation with respect to the total scale (measured with data from the study of Van den Hout et al., 2008). The items were altered by changing general words like 'the' and 'objects' into 'the gas stove' in order to create more object-specific items. The items are presented in table 1.

Table 1. Dissociation items used in current study (in italics) in Dutch, used items in English (a), original Dutch translation (b) (Van den Hout et al., 2008) and original English items (c) (Bremner et al., 1998).

-
1. *Het leek alsof het gasstel onwerkelijk was, alsof ik aan het dromen was.*
 - a. Does the gas stove seems to be unreal to you, as if you are in a dream?
 - b. Het leek alsof dingen onwerkelijk waren, alsof ik aan het dromen was.
 - c. Do things seem to be unreal to you, as if you are in a dream?
 2. *Ik had het gevoel dat het gasstel er anders uitzag dan ik verwachtte.*
 - a. Does the gas stove look different than you would expect?
 - b. Ik had het gevoel dat voorwerpen er anders uitzagen dan ik verwachtte.
 - c. Do objects look different than you would expect?
 3. *Ik had het gevoel dat kleuren in intensiteit verminderd waren van het gasstel.*
 - a. Do colours of the gas stove seem to be diminished in intensity?
 - b. Ik had het gevoel dat kleuren in intensiteit verminderd waren.
 - c. Do colours seem to be diminished in intensity?
 4. *Ik zag het gasstel alsof ik in een tunnel was, of door een grote fotografische lens keek.*
 - a. Do you see the gas stove as if you were in a tunnel, or looking through a wide angle photographic lens?
 - b. Ik zag dingen alsof ik in een tunnel was, of door een grote fotografische lens keek.
 - c. Do you see things as if you were in a tunnel, or looking through a wide angle photographic lens?
 5. *Het leek alsof ik de wereld door een waas bekeek, zodat het gasstel verder weg of onduidelijk leek.*
 - a. Does it seem as if you are looking at the gas stove through a fog, so that people and objects appear far away or unclear?
 - b. Het leek alsof ik de wereld door een waas bekeek, zodat voorwerpen verder weg of onduidelijk leken.
 - c. Does it seem as if you are looking at the world through a fog, so that people and objects appear far away or unclear?
-

Uncertainty

With respect to experienced uncertainty quotations given by Reed (1985) were slightly transformed and translated in Dutch in the experiment of Van den Hout et al. (2008). For this experiment the same items are used: 'It's as though I have seen it, but it isn't clear enough', 'I remember seeing it somehow, but it's all fuzzy', 'I can remember that I have seen it, but the perception isn't clear somehow'. The degree to which the participant agreed with these quotations was indicated on a 100mm VAS's running from 0 (does not apply to me at all) to 100 (applies to me completely).

The Brief Cognitive Confidence Questionnaire (BCCQ; Hermans et al., 2008) was used to measure cognitive confidence in perception. One subscale of the BCCQ was

selected. The item assesses confidence in visual perception after perseverative staring. The item was adjusted to this experiment: "What I have seen during the last episode of observing the object, felt reliable". This statement had to be rated on a 100mm VAS's running from 0 (does not apply to me at all) to 100 (applies to me completely).

A similar 0-100 VAS-scale was added to measure confidence in visual perception, assessed by asking participants to indicate how confident they felt about their perception.

Procedure experiment

Participants were tested in dimly lit and sound-attenuated laboratory room where they sat at a table at 75cm distance of a real stove (situated in the middle of the desk). The experimenter handed out the instructions, written on a sheet. During the experiment, the observer sat behind the participant, to ensure that the participant accomplished the task correctly. Participants were randomly assigned to either group 1, 2, 3, 4 or 5.

Group 1: Control Group (no perseveration)

At the pre-test the participants were asked to look at the gas stove (for strictly three seconds), and immediately after that had to complete the questionnaire. After they completed the pre-test, the participants were given a puzzle and were asked to work on this puzzle for the next five minutes. After five minutes they were asked to look at the gas stove again and had to complete the same questionnaire concerning the last view of the gas stove.

Group 2: Experimental Group (7,5 seconds of perseveration)

At the pre-test participants had to look at the gas stove (three seconds) and were asked to complete the questionnaire. After they had completed the pre-test the participants were instructed to work on a word puzzle for the next four minutes and 52,5 seconds. The observer informed the participants when they completed this task, and they were asked to stare at the gas stove for 7,5 seconds. Afterwards they were asked to complete the same questionnaire concerning the last view of the gas stove.

Group 3: Experimental Group (15 seconds of perseveration)

At the pre-test participants had to look at the gas stove (three seconds) and were asked to complete the questionnaire. After the pre-test the participants were instructed to work on a word puzzle for the next four minutes and 45 seconds. The observer gave the participants a sign when they could stop working on the word puzzle, and they were asked to stare at the gas stove for fifteen seconds. Afterwards the participants were asked to complete the same questionnaire concerning the last view of the gas stove.

Group 4: Experimental Group (30 seconds of perseveration)

At the pre-test participants had to look at the gas stove (three seconds) and then were asked to complete the questionnaire. After the pre-test the participants were instructed to work on a word puzzle for the next four minutes and 45 seconds. The observer gave the participants a sign when they completed this task, and they were asked to stare at the gas stove for thirty seconds. Afterwards they were asked to complete the same questionnaire for the last view of the gas stove.

Group 5: Experimental Group (5 minutes of perseveration)

At the pre-test participants had to look at the gas stove (three seconds) and then were asked to complete the questionnaire. After the pre-test the participants were instructed to stare at the gas stove for the next five minutes. Afterwards they were asked to complete the same questionnaire for the last view of the gas stove.

Statistical Analysis

SPSS 16.0 was used to perform statistical analyses. A 2-way Repeated Measures ANOVA was used to measure the time, condition and time x condition interaction effect ($p < .05$). A factor-analysis was performed to verify if the dissociation- and uncertainty scores were loading on one factor.

Results

Factor Analysis

Dissociation

The five dissociation questions were factor-analysed for both pre-test scores and post-test scores. The results are presented in table 2. Although this did not reveal a one-factor solutions for the five items at pre-test, based on post-test scores, it was decided to take all five items into account.

Table 2. Factor analysis, five question loading on one factor (dissociation)

Questions analysed with a factor analysis	Component 1 loading	
	Pre-test	Post-test
'Does the gas stove seems to be unreal to you, as if you are in a dream?'	.699	.869
'Does the gas stove look different than you would expect?'	-.194	.555
'Do colours of the gas stove seem to be diminished in intensity?'	.735	.644
'Do you see the gas stove as if you were in a tunnel, or looking through a wide angle photographic lens?'	.459	.735
'Does it seem af if you are looking at the gas stove through a fog, so that people and objects apear far away or unclear?'	.813	.816

Uncertainty about perception.

The five uncertainty questions were factor-analysed for both pre-test scores and post-test scores. Results are presented in table 3. This revealed a one-factor solution for the five items. The five items were taken as a one scale reflecting uncertainty.

Table 3. Factor analysis, five questions loading on one factor (uncertainty)

Questions analysed with a factor analysis	Component 1 (loading)	
	Pre-test	Post-test
'It's as though the memory is there, but it isn't definite enough'	.913	.898
'I remember doing it in a way, but it's all fuzzy'	.893	.925
'I can remember that I've done it, but the memory isn't clear somehow'	.866	.903
'What I have seen felt reliable'	.719	.697
'What I have seen felt rather certain'	.789	.826

Dissociation

Mean scores for dissociation according to condition and time are presented in Fig. 4.

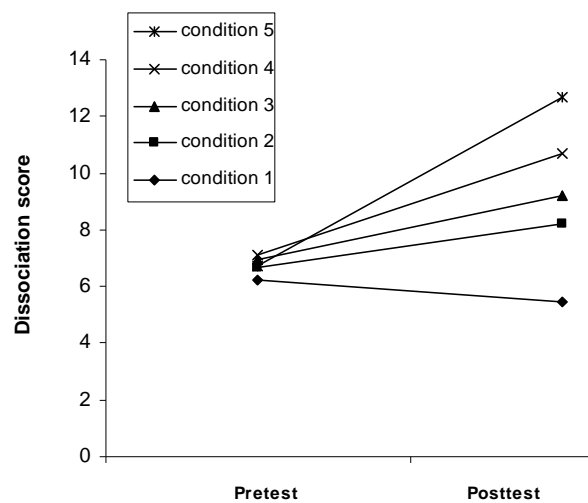


Figure 4. Dissociation scores before and after staring for 0; 7,5; 15; 30; 300 seconds

Data are analyzed with a 2 x 5 ANOVA with Time (pre-test vs. post-test) as within group factor and condition (duration of perseveration) as between group factor. A Two-way repeated measures ANOVA shows that there is a main effect of time on dissociation [$F(1,75)=45.039$, $p<.05$, partial $\eta^2=.38$]. This means that there is a significant different outcome from pre-test to post-test with regard to feelings of dissociation. Tests of between subject effects show that there is a main effect of condition on dissociation [$F(4,75)=9.08$, $p<.05$, partial $\eta^2=.33$], meaning that the feelings of dissociation are influenced by the duration of perseveration. There is also

an interaction effect of time x condition on dissociation scores [$F(1,75)=9.09, p<.05$, partial $\eta^2=.33$]. This means that the difference of dissociation scores between pre-test and post-test is influenced by the duration of staring (which condition people are in).

Paired samples t-tests show that all conditions have a statistically significant mean difference between pre-test and post-test for dissociation. Significance scores are presented in table 4. Remarkably, the results indicate that the 'no perseveration' condition shows a significant effect as well; participants showed significantly less feelings of dissociation at post-test ($M=5.44, SD=.63$) compared to pre-test ($M=6.25, SD=1.29$).

Table 4. Paired samples T-test conducted for effects of condition on dissociation.

Condition	Mean increase	Std. Deviation	T (df=15)	Sig.
No perseveration	-.8	1.4	-2.28	.038
7,5 sec. Perseveration	1.5	2.6	2.28	.038
15 sec. Perseveration	2.3	3.5	2.61	.020
30 sec. Perseveration	3.6	3.3	4.36	.001
300 sec. Perseveration	5.9	4.8	3.36	.000

Uncertainty

Mean uncertainty scores according to condition and time are presented in figure 5.

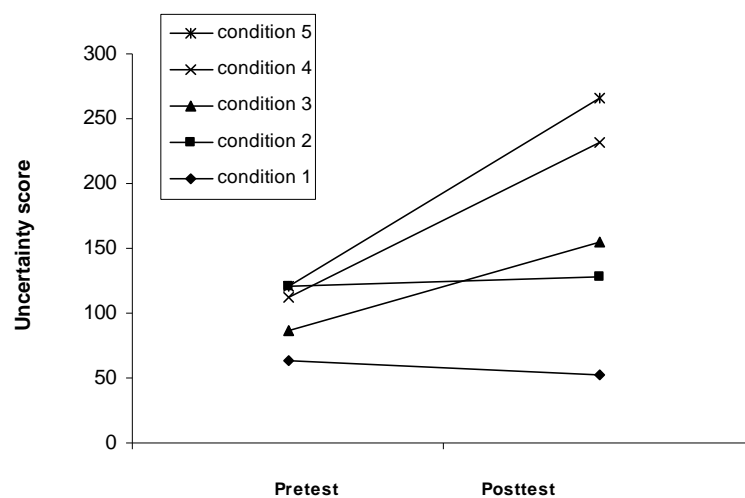


Figure 5. Uncertainty scores before and after staring for 0; 7,5; 15; 30; 300 seconds

Data are analyzed with a 2 x 5 ANOVA with Time (pre-test vs. post-test) as within group factor and condition (duration of perseverance) as between group factor. A Two-way repeated measures ANOVA shows that there is a main effect of time on uncertainty [$F(1,75)=23.89, p<.05, \text{partial } \eta^2=.24$]. This means that there is a significant different outcome from pre-test to post-test with regard to feelings of dissociation. Tests of between subject effects show that there is a main effect of condition on uncertainty [$F(4,75)=6.95, p<.05, \text{partial } \eta^2=.27$], meaning that the feelings of uncertainty are influenced by the duration of perseverance. There is also an interaction effect of time x condition on uncertainty scores [$F(1,75)=4.88, p<.05, \text{partial } \eta^2=.21$]. This means that the difference of uncertainty scores between pre-test and post-test is influenced by the duration of staring (which condition people are in).

Paired samples t-tests show that the 15 seconds perseverance, 30 seconds perseverance and 300 seconds perseverance conditions have a statistically significant mean difference between pre-test and post-test for uncertainty. Significance scores are presented in table 5.

Table 5. Paired samples T-test conducted for effects of condition on uncertainty.

Condition	Mean increase	Std. Deviation	T (df=15)	Sig.
No perseverance	-10.6	44.7	-.95	.359
7,5 sec. Perseveration	7.2	121.8	24	.817
15 sec. Perseveration	75.1	101.7	2.96	.010
30 sec. Perseveration	120.3	116.0	4.15	.001
300 sec. Perseveration	144.8	187.9	3.08	.008

A comprehensive graphic impression of the time course can be gained from figure 6. The figure shows the maximum increase observed after five minutes of visual perseverance is indexed as 100%, while the earlier increases are expressed as percentages of this maximum increase. Fig. 6 shows that both dependant variables follow a logarithmic curve with the sharpest increase in dissociation and uncertainty

occurring right after staring sets in. For both dissociation and uncertainty 50% of the maximal effects were already observed after approximately 25 seconds.

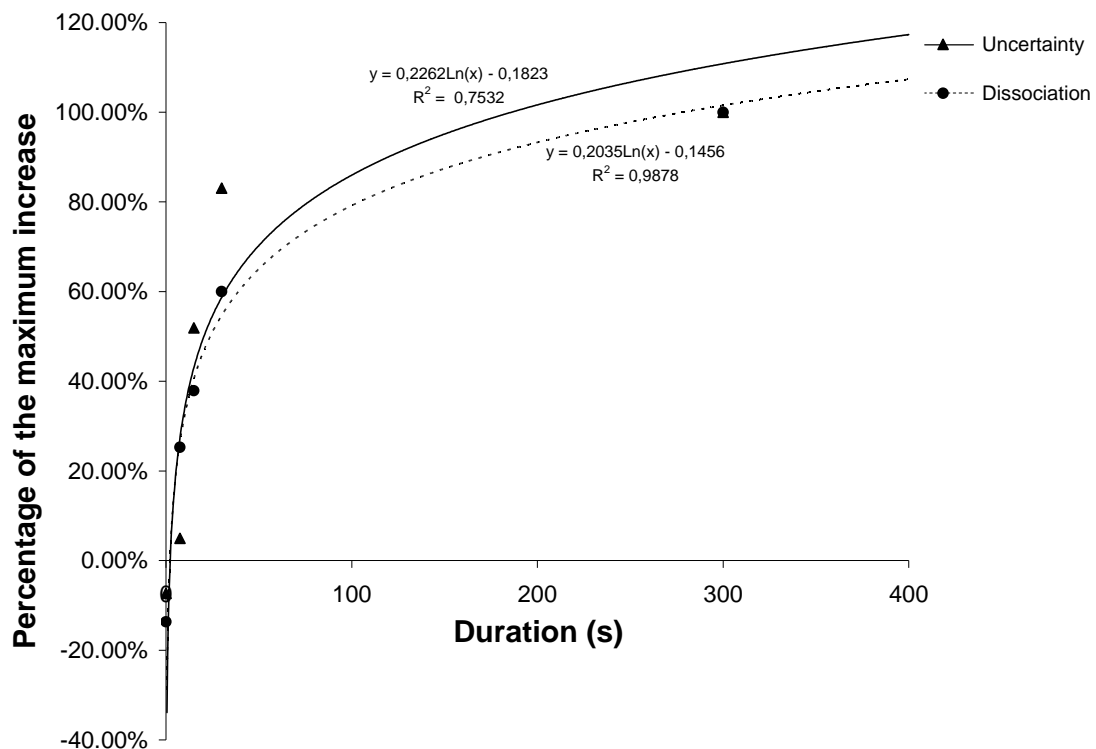


Figure 6. Time course of increases of dissociation and uncertainty after visual perseveration.

Correlational analyses.

Correlations between dissociation and uncertainty scores were significant, both at the pre-test ($r=.43$; $p<0.05$) and the post-test ($r=.79$; $p<0.05$). Moreover, the pre-to-post changes in dissociation and uncertainty were significant related ($r=.75$; $p<0.05$).

Discussion

The aim of the current study was to critically examine the time course of feelings of dissociation and uncertainty after perseveration of visual perception. Earlier studies found that one's confidence about perception and feelings of dissociation increase after a ten-minute period of perseveration of visual perception (Hermans, 2008; Van den Hout et al., 2008). Although there are no controlled data regarding duration of staring by OCD patients, it may seem that a ten-minute period of staring is extremely long. As suggested by Van den Hout et al. (2008), the staring paradigm may serve as a laboratory model of OCD visual perseveration. It is, however, for the credibility of the model crucial to know when exactly uncertainty and dissociation set in after staring is started.

In this current study it was hypothesized that the effects of perseverative staring on feelings of uncertainty and dissociation occur after less than ten minutes of staring. Five experimental conditions were compared, with each a different staring period: 0; 7,5; 15; 30; 300 seconds.

With regards to feelings of dissociation there is a significant different outcome in pre-test and post-test scores across all conditions. It is found that feelings of dissociation are influenced by the duration of perseveration. Remarkably, it was observed that the 'no perseveration' condition shows a significant effect on dissociation, while no staring was performed. Participants showed significantly *less* feelings of dissociation at post-test compared to pre-test. A possible explanation for this finding could be due to the fact that the participants were not at ease during pre-test and that they got more comfortable in the experimental setting after five minutes of filler task. This may have resulted in the small, but significant, decrease in dissociation. An interaction effect is found as well, meaning that the difference of dissociation scores between pre-test and post-test are influenced by the duration of staring.

With regards to uncertainty, there is an interaction effect, meaning that the difference of uncertainty scores between pre- and post-test is influenced by duration of staring. Participants experienced more feelings of uncertainty at post-test,

however, the increase depends on the duration of staring: the longer the perseveration period, the larger the effects.

As presented in the results section, both dissociation and uncertainty follow a logarithmic curve with the sharpest increase in dissociation and uncertainty occurring right after staring sets in, meaning that the effects of staring on both feelings of uncertainty and dissociation already occur after a small period of time. Compared to the results of the study by Van den Hout et al. (2008) in which they used a ten-minute period of visual perseveration, the results of the current study, in which the longest perseveration time was five minutes, were similar. The conclusion of this outcome is that it is unnecessary to stare at an object for ten minutes to experience increased levels of feelings of uncertainty and dissociation. This strengthens the credibility of the staring paradigm as an experimental model of clinical visual perseveration at an object.

Our findings add to earlier ones showing that perseverative *checking* induces uncertainty in *memory* (Coles et al., 2006; Van den Hout & Kindt, 2003; Radomsky et al., 2006) suggesting that the '*perseverative checking* \Rightarrow *memory uncertainty*' phenomenon may represent a special case of an encompassing pattern: '*perseveration* \Rightarrow *uncertainty*'.

The findings of this research are consistent with the theory of Van den Hout and Kindt (2004), carrying out that perseverative behaviour is sufficient to create OCD-like uncertainty. By expanding that study, Radomsky et al. (2006) replicated these results and confirmed that repeated checking does indeed lead to memory distrust. The current study supports the theory that visual perseveration leads to uncertainty about the perceived object, like checking does as well.

The fact that feelings of uncertainty and dissociation occur after a short period of visual perseveration is in accordance with the results of the study of Coles et al. (2006). Coles et al. found that the effects of checking on feelings of uncertainty and dissociation occur after less than 20 checks. Since we suggest that '*perseveration* \Rightarrow *uncertainty*' a parallel can be drawn between the results of Coles et al (2006) and the

current study: The effects of perseveration on feelings of uncertainty and dissociation is a rapid occurring phenomenon for checking as well as staring.

A few points of interest are worth mentioning in the following section.

This experiment found a link between increasing duration of staring and increasing feelings of dissociation and uncertainty. While the link between dissociation and uncertainty needs to be further investigated, speculations can be done about this relationship.

It could be the case that it is the feeling of dissociation, caused by the visual perseveration, that leads people to feel uncertain about their perception (*staring* \Rightarrow *dissociation* \Rightarrow *uncertainty*). However, in the study of Van den Hout et al. (2008) it is argued that increased uncertainty after visual perseveration cannot be the result of increased dissociation. In their study uncertainty scores, but not the dissociation scores, were stronger influenced in the experimental group (relevant staring) as in their control group (irrelevant staring), indicating that uncertainty increased independently of dissociation scores.

Based on the high correlates between dissociation- and uncertainty scores in the current study, it might be argued whether the two scales do indeed measure different factors. Maybe there is no strict separation in which *staring* \Rightarrow *uncertainty* and *staring* \Rightarrow *dissociation*, but is it more a case of a mixed factor, in which *staring* \Rightarrow 'dissociative uncertainty'. To further investigate this argument a factor analysis was conducted to see whether visual perseveration leads to feelings of uncertainty and dissociation, or to one component: 'dissociative uncertainty'. Factor analysis of post-test scores for uncertainty and dissociation showed that after visual perseveration all items seem to be loading on one factor (varying from .54 and .92). This indicates that the effects observed with the current items refer to one factor instead of two. This could be evidential support for the model stating that *staring* \Rightarrow 'dissociative uncertainty'. It needs to be emphasized that further research needs to be conducted in this area. Nevertheless, it would be interesting to investigate the 'dissociation – uncertainty' link more closely.

Another point of interest is the modified dissociation-scale that is used in this study. Because the study of Van den Hout et al. (2008) found an equally strong effect

of perseverative staring on dissociation for both control group and experimental group, the current study used only relevant staring conditions. To improve the measurement of dissociation, the comments reported in their study were taken into account. In the current study only those items of the CADSS that specifically relate to object-perception are used (and modified), in order to find out whether perseverative staring results in experienced dissociation. Because the current study did not include a control group in which irrelevant-staring was performed, no comparisons can be made to see whether dissociation would increase stronger in a relevant staring condition vs. an irrelevant staring condition. To find out whether the lack of finding such outcomes in the previous study of Van den Hout et al. (2008) is due to their non-specific 19-items long dissociation scale, the current study (with 5 object-specific dissociation items) could be replicated in further research with the addition of a control group.

In line with this topic is the fact that in the current study, factor analysis showed that one item of the currently used 5-item dissociation scale, shows a remarkable loading (-.194) on the total component at pre-test. Because this item loads satisfactory (.555) on the total component at post-test, it is decided to still take it into account with further analysis of the data. A possible explanation of the remarkable component-loading of the item could be the object at which the item refers. The concerning item is: 'Does the gas stove looks different than you would expect?'. The used item was a blue, one-pitted gas stove. Nowadays, an item like that doesn't look as expected when 'gas stove' is mentioned.

Apart from the time course that is investigated in this study, the phenomenon itself seems robust, at least in the realms of memory and perception, and relevant for the understanding of the maintenance of OCD. It is replicated that staring causes an increase of dissociation and uncertainty with regards to perception, with the extension of the time course of this phenomenon. The fact that uncertainty and dissociation sets in early after perseveration is performed, stresses the ecological validity of the phenomenon. It is not considered likely for individuals to stare for ten

minutes in real life. This study advocates that the phenomenon is not an artefact of laboratory studies.

Perseveration again seems to be a counter-productive strategy to obtain confidence. Therefore the clinical implication is to drop perseverative staring, in order to let the safety behavior as displayed by OCD patients no longer serve to aggravate the very problems they are supposed to reduce. Exposure and Ritual Prevention are good strategies to accomplish this (Foa & Franklin, 2007).

Acknowledgements

The authors would like to thank Marcel van den Hout for his assistance, cooperation and dedication with the study presented herein.

References

- American Psychiatric Association (1994). Diagnostic and statistical manual of mental disorders, 4th edition, Washington D.C., American Psychiatric Association.
- Boschen, M.J., & Vuksanovic, D. (2007). Deteriorating memory confidence, responsibility, perceptions and repeated checking: Comparisons in OCD and control samples. *Behaviour Research and Therapy*, *45*, 2098-2109.
- Bremner, J.D., Krystal, J.H., Putnam, F.W., Southwick, S.M., Marmar, C., Charney, D.S., et al. (1998). Measurement of dissociative states with the clinician-administrated dissociative states scale (CADSS). *Journal of Traumatic Stress*, *11*, 125-136.
- Brown, H.D., Kosslyn, S.M., Breitner, H.C., Baer, L. & Jenike, M.A. (1995). Can patients with obsessive-compulsive disorder discriminate between percepts and mental images? A signal detection analysis. *Journal of Abnormal Psychology*, *103*, 445-454.
- Coles, M.E., Radomsky, A.S., & Horng, B. (2006). Exploring the boundaries of memory distrust from repeated checking: Increasing external validity and examining thresholds. *Behaviour Research and Therapy*, *44*, 995-1006.
- Constans, J.J., Foa, E.B., Franklin, M.E., & Matthews, A. (1995). Memory for actual and imagined events in OC checkers. *Behaviour Research and Therapy*, *33*, 665-671.
- Dar, R. (2004). Elucidating in mechanism of uncertainty and doubt in obsessive-compulsive checkers. *Journal of Behavior Therapy and Experimental Psychiatry*, *35*, 153-163.
- Dar, R., Rish, S., Hermesh, H., Fyx, M., & Taub, M. (2000). Realism of confidence in obsessive-compulsive checkers. *Journal of Abnormal Psychology*, *109*, 673-678.
- Ecker, W., & Engelkamp, J. (1995). Memory for actions in obsessive-compulsive disorder. *Behavioural and Cognitive Psychotherapy*, *23*, 349-371.
- Goff, D.C., Olin, J.A., Jenike, M.A., Baer, L., & Buttolph, M.L. (1992). Dissociative symptoms in patients with obsessive-compulsive disorder. *Journal of Nervous and Mental Disease*, *180*, 332-337.

- Grabe, H.J., Goldschmidt, F., Lehmkuhl, L., Gansicke, M., Spitzer, C., & Freyberger, H.J. (1999). Dissociative symptoms in obsessive-compulsive dimensions. *Psychopathology, 32*, 319-324.
- Hermans, D., Martens, K., DeCort, K., Pieters, G., & Eelen, P. (2003). Reality monitoring and metacognitive beliefs related to cognitive confidence in obsessive-compulsive disorder. *Behaviour Research and Therapy, 41*, 383-401.
- Hermans, D., Engelen, U., Grouwels, L., Joos, E., Lemmens, J., & Pieters, G. (2008). Cognitive confidence in obsessive-compulsive disorder: Distrusting perception attention and memory. *Behaviour Research and Therapy, 46*, 98- 113.
- Holmes, E.A., Brewin, C.R., & Hennessey, R.G. (2004). Trauma films, information processing, and intrusive memory development. *Journal of Experimental Psychology: General, 133* (1), 3-22.
- Hout, M.A. van den, Engelhard, I.M., Boer, C. de, Bois, A. de, Dek, E. (2008). Perseverative and compulsive-like staring causes uncertainty about perception. (in press).
- Hout, M.A. van den, & Kindt, M. (2003a). Repeated checking causes memory distrust. An explanation of meta-memory problems in compulsive checking. *Behavior Research and Therapy, 41*, 301-316.
- Hout, M.A. van den, & Kindt, M. (2003b). Phenomenological validity of an OCD-memory model and remember/know distinction. *Behavior Research and Therapy, 41*, 369-378.
- Hout, M.A. van den, & Kindt, M. (2004). Obsessive-compulsive disorder and the paradoxical effects of perseverative behaviour on experienced uncertainty. *Journal of Behavior Therapy and Experimental Psychiatry, 35*, 165-181.
- Jenike, M.A., Baer, L., & Minichiello, W.E. (Eds.). (1990). *Obsessive-compulsive disorders: Theory and management* (2nd ed.) Boston: Year Book Medical.
- Karadag, F., Oguzhanoglu, N., Ozdel, O., Atesci, F.C., & Amuc, T. (2005). Memory function in patients with obsessive-compulsive disorder and the problem of confidence in their memories: A clinical study. *Croatian Medical Journal, 46*, 282-287.

- Leonard, K.N., Telch, M.J., & Harrington, P.J. (1999). Dissociation in the laboratory: A comparison of strategies. *Behavior Research and Therapy*, 37, 49-61.
- MacDonald, P.A., Antony, M.M., MacLeod, C.M., & Richter, M.A. (1997). Memory and confidence in memory judgments among individuals with obsessive-compulsive disorder and non-clinical controls. *Behaviour Research and Therapy*, 35, 497-505.
- McNally, R.J., & Kohlbeck, P.A. (1993). Reality monitoring in obsessive-compulsive disorder. *Behaviour Research and Therapy*, 31, 249-253.
- Merckelbach, H., & Wessel, I. (2000). Memory for actions and dissociation in obsessive-compulsive disorder. *Journal of Nervous and Mental Disease*, 188, 846-848.
- Nedeljkovic, M., & Kyrios, M. (2007). Confidence in memory and other cognitive processes in obsessive-compulsive disorder. *Behaviour Research and Therapy*, 45, 2899-2914.
- Rachman, S. (2002). A cognitive theory of compulsive checking. *Behaviour Research and Therapy*, 40, 625-639.
- Radomsky, A.S., Gilchrist, P.T., & Dussault, D. (2006). Repeated checking really does cause memory distrust. *Behaviour Research and Therapy*, 44, 305-316.
- Reed, G.F. (1985). *Obsessional experience and compulsive behaviour. A cognitive-structural approach*. London: Academic Press.
- Rufer, M., Fricke, S., Held, D., Cremer J., & Hand, I. (2006). Dissociation and symptom dimensions of obsessive-compulsive disorder. *European Archives of Psychiatry Clinical Neuroscience*, 256, 146-150.
- Sher, K.J., Frost, R.O., & Otto, R. (1983). Cognitive deficits in compulsive checkers: An exploratory study. *Behaviour Research and Therapy*, 21, 357-363.
- Tuna, Ş., Tekcan, A. İ., & Topçuoğlu, V. (2005). Memory and metamemory in obsessive-compulsive disorder. *Behaviour Research and Therapy*, 43, 15-27.
- Zitterl, W., Urban, C., Linzmayer, L., Aigner, M., Demal, U., & Semlre, B. (2001). Memory deficits in patients with DSM-IV obsessive-compulsive disorder. *Psychopathology*, 34, 113-117.

Appendix A
Instructions condition 1

Proefpersoonnummer:
Conditie: 0



Instructies

Dit onderzoek zal ongeveer 10 minuten in beslag nemen. Lees de instructies zorgvuldig.

Voor dit onderzoek neem je straks plaats op een stoel achter een tafel waar een gasstel op staat. Laat de stoel op de plek staan. De proefleider zal stil in dezelfde kamer op een stoel zitten tijdens het afnemen van de test.

In dit onderzoek word je gevraagd om te kijken naar het gasstel, daarover een vragenlijst in te vullen en vervolgens een puzzel te maken. Aan het einde van het onderzoek wordt opnieuw een vragenlijst afgenomen.

Tussendoor zal de proefleider instructies geven over hetgeen dat er zal gaan plaatsvinden.

Als je nog vragen hebt kun je die nu stellen.

Geslacht proefpersoon: man / vrouw

Leeftijd: jaar

Datum:

Akkoord:
(handtekening)

Appendix A
Instructions condition 2, 3, 4

Proefpersoonnummer:
Conditie: 7,5 / 15 / 30



Instructies

Dit onderzoek zal ongeveer 10 minuten in beslag nemen. Lees de instructies zorgvuldig.

Voor dit onderzoek neem je straks plaats op een stoel achter een tafel waar een gasstel op staat. Laat de stoel op de plek staan. De proefleider zal stil in dezelfde kamer op een stoel zitten tijdens het afnemen van de test, en tussentijdse instructies geven.

Je kijkt zo eerst kort naar het gasstel. De proefleider zal aangeven wanneer je hiermee dient te beginnen en wanneer je hier weer mee moet stoppen. Daarna wordt een vragenlijst afgenomen. Vervolgens krijg je een taakje. Hierbij is het niet belangrijk hoe snel je dit doet. Maak het in je eigen tempo, de proefleider zal aangeven wanneer je hiermee mag stoppen.

Daarna moet je je blik fixeren op het middelste gedeelte van de gaspit. De proefleider zal opnieuw aangeven wanneer je hiermee dient te beginnen en wanneer je hier weer mee moet stoppen. **Praat niet tijdens het fixeren, wend je blik niet af en probeer echt te staren naar de gaspit. Het is belangrijk dat je je goed concentreert en je ogen stil probeert te houden.**

Tot slot wordt er een vragenlijst afgenomen.

Als je nog vragen hebt kun je die nu stellen.

Geslacht proefpersoon: man / vrouw

Leeftijd: jaar

Datum:

Akkoord:
(handtekening)

Appendix A

Instructions condition 5

Proefpersoonnummer:
Conditie: 300



Instructies

Dit onderzoek zal ongeveer 10 minuten in beslag nemen. Lees de instructies zorgvuldig.

Voor dit onderzoek neem je straks plaats op een stoel achter een tafel waar een gasstel op staat. Laat de stoel op de plek staan. De proefleider zal stil in dezelfde kamer op een stoel zitten tijdens het afnemen van de test, en tussentijdse instructies geven.

Je kijkt zo eerst kort naar het gasstel. De proefleider zal aangeven wanneer je hiermee dient te beginnen en wanneer je hier weer mee moet stoppen. Daarna wordt een vragenlijst afgenomen.

Daarna moet je je blik fixeren op het middelste gedeelte van de gaspit. De proefleider zal opnieuw aangeven wanneer je hiermee dient te beginnen en wanneer je hier weer mee moet stoppen. **Praat niet tijdens het fixeren, wend je blik niet af en probeer echt te staren naar de gaspit. Het is belangrijk dat je je goed concentreert en je ogen stil probeert te houden.**

Tot slot wordt er een vragenlijst afgenomen.

Als je nog vragen hebt kun je die nu stellen.

Geslacht proefpersoon: man / vrouw

Leeftijd: jaar

Datum:

Akkoord:
(handtekening)

Appendix A

Verbal Instructions

Verbal instruction condition 0 (no perseveration)

- Ik zal je zometeen vragen naar het gasstel te kijken. Ik zal aangeven wanneer je mag beginnen en wanneer je weer moet stoppen. (geef 3 seconden kijktijd)
- Vul nu vragenlijst 1 in die voor je ligt. Als je klaar bent kun je de vragenlijst naast je neerleggen.
- Begin nu aan de woordzoeker. Doe dit in je eigen tempo. Ik zal aangeven wanneer je hiermee mag stoppen.
- (Na 300 seconden) Stop nu met de puzzel. Zo meteen ga ik je vragen om nog een keer naar het gasstel te kijken. Ik zal aangeven wanneer je hiermee mag beginnen en wanneer je weer mag stoppen.
- (na 3 seconden kijken) Stop nu met kijken en vul vragenlijst 2 in.

Verbal instructions condition 7,5 / 15 / 30 sec.

- Ik zal je zometeen vragen naar het gasstel te kijken. Ik zal aangeven wanneer je mag beginnen en wanneer je weer moet stoppen. (geef 3 seconden kijktijd)
- Vul nu vragenlijst 1 in die voor je ligt. Als je klaar bent kun je de vragenlijst naast je neerleggen.
- Begin nu aan de woordzoeker. Doe dit in je eigen tempo. Ik zal aangeven wanneer je hiermee mag stoppen.
- (Na 292,5 / 285 / 230 seconden) Stop nu met de puzzel. Zo meteen ga ik je vragen om naar het gasstel te staren. Fixeer je blik op het midden van de gaspit, probeer je echt te concentreren en beweeg je ogen niet. Het is echt de bedoeling dat je goed staart en niet wegstijgt van het gasstel. Ik zal aangeven wanneer je hiermee mag beginnen en wanneer je weer mag stoppen.
- (na 7,5 / 15 / 30 seconden staren) Stop nu met staren en vul vragenlijst 2 in.

Verbal instruction condition 300 sec. perseveration

- Ik zal je zometeen vragen naar het gasstel te kijken. Ik zal aangeven wanneer je mag beginnen en wanneer je weer moet stoppen. (geef 3 seconden kijktijd)
- Vul nu vragenlijst 1 in die voor je ligt. Als je klaar bent kun je de vragenlijst naast je neerleggen.
- Zo meteen ga ik je vragen om naar het gasstel te staren. Fixeer je blik op het midden van de gaspit, probeer je echt te concentreren en beweeg je ogen niet. Het is echt de bedoeling dat je goed staart en niet wegstijgt van het gasstel. Ik zal aangeven wanneer je hiermee mag beginnen en wanneer je weer mag stoppen.
- (na 300 seconden staren) Stop nu met staren en vul vragenlijst 2 in.

Appendix B Questionnaires

Proefpersoonnummer:

Conditie:

Pre / post



Geef aan hoe je het kijken naar het gasstel hebt ervaren.

Kruis het rondje aan dat je mening over de uitspraak het beste reflecteert.

Helemaal niet *Een beetje* *Redelijk* *Behoorlijk* *Heel erg*

1. Het leek alsof het gasstel onwerkelijk was, alsof ik aan het dromen was.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Ik had het gevoel dat het gasstel er anders uitzag dan ik verwachtte.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Ik had het gevoel dat kleuren en intensiteit van het gasstel verminderd waren.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Ik zag het gasstel alsof ik in een tunnel was, of door een grote fotografische lens keek.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Het leek alsof ik de wereld door een waas bekeek, zodat het gasstel verder weg of onduidelijk leek.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

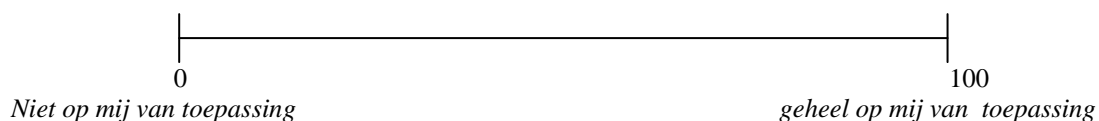
Ga verder op de achterkant

Geef antwoord op de volgende vragen door middel van een streep door de lijn te zetten.

6. Het is alsof ik het zag, maar het was niet helder genoeg.



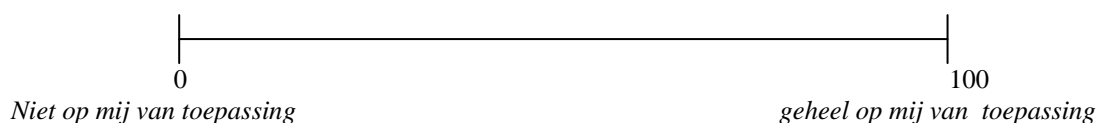
7. Op de een of andere manier zag ik het, maar het was allemaal wat vaag.



8. Ik wist dat ik het zag, maar op de een of andere manier was het beeld niet duidelijk.



9. Wat ik heb gezien tijdens het kijken naar het gasstel voelde betrouwbaar.



10. Ik voelde me heel zeker over wat ik zag toen ik naar het gasstel keek.



Appendix C SPSS Output

*Repeated Measures ANOVA for effect of time and condition on dissociation
and time*condition interaction effect*

Tests of Within-Subjects Contrasts

Measure: MEASURE_1

Source	tijd	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
tijd	Linear	247,506	1	247,506	45,039	,000	,375
tijd * Conditie	Linear	199,838	4	49,959	9,091	,000	,327
Error(tijd)	Linear	412,156	75	5,495			

Tests of Between-Subjects Effects

Measure: MEASURE_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	10224,006	1	10224,006	1,327E3	,000	,947
Conditie	279,838	4	69,959	9,083	,000	,326
Error	577,656	75	7,702			

*Repeated Measures ANOVA for effect of time and condition on uncertainty and time*condition interaction effect*

Tests of Within-Subjects Contrasts

Measure:MEASURE_1

Source	tijd	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
tijd	Linear	181440,900	1	181440,900	23,892	,000	,242
tijd * Conditie	Linear	148316,037	4	37079,009	4,883	,001	,207
Error(tijd)	Linear	569566,062	75	7594,214			

Tests of Between-Subjects Effects

Measure:MEASURE_1

Transformed Variable:Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	2889062,500	1	2889062,500	228,674	,000	,753
Conditie	351325,812	4	87831,453	6,952	,000	,270
Error	947546,687	75	12633,956			

T-test for dissociation

Paired Samples Statistics

conditie			Mean	N	Std. Deviation	Std. Error Mean
niet staren	Pair 1	totaalscore dissociatie pretest	6,25	16	1,291	,323
		totaalscore dissociatie posttest	5,44	16	,629	,157
7,5 seconden staren	Pair 1	totaalscore dissociatie pretest	6,69	16	1,778	,445
		totaalscore dissociatie posttest	8,19	16	3,060	,765
15 seconden staren	Pair 1	totaalscore dissociatie pretest	6,94	16	1,569	,392
		totaalscore dissociatie posttest	9,19	16	3,209	,802
30 seconden staren	Pair 1	totaalscore dissociatie pretest	7,12	16	1,821	,455
		totaalscore dissociatie posttest	10,69	16	3,497	,874
300 seconden staren	Pair 1	totaalscore dissociatie pretest	6,75	16	1,770	,443
		totaalscore dissociatie posttest	12,69	16	4,468	1,117

Paired Samples Correlations

conditie			N	Correlation	Sig.
niet staren	Pair 1	totaalscore dissociatie pretest & totaalscore dissociatie posttest	16	,021	,940
7,5 seconden staren	Pair 1	totaalscore dissociatie pretest & totaalscore dissociatie posttest	16	,514	,042
15 seconden staren	Pair 1	totaalscore dissociatie pretest & totaalscore dissociatie posttest	16	,082	,763
30 seconden staren	Pair 1	totaalscore dissociatie pretest & totaalscore dissociatie posttest	16	,383	,143
300 seconden staren	Pair 1	totaalscore dissociatie pretest & totaalscore dissociatie posttest	16	-,019	,944

Paired Samples Test

conditie	Paired Differences					t	df	Sig. (2-tailed)	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
				Lower	Upper				
niet staren Pair 1	totaalscore dissociatie pretest - totaalscore dissociatie posttest	,812	1,424	,356	,053	1,572	2,282	15	,038
7,5 seconden staren Pair 1	totaalscore dissociatie pretest - totaalscore dissociatie posttest	-1,500	2,633	,658	-2,903	-,097	-2,279	15	,038
15 seconden staren Pair 1	totaalscore dissociatie pretest - totaalscore dissociatie posttest	-2,250	3,454	,864	-4,091	-,409	-2,605	15	,020
30 seconden staren Pair 1	totaalscore dissociatie pretest - totaalscore dissociatie posttest	-3,562	3,265	,816	-5,302	-1,823	-4,364	15	,001
300 seconden staren Pair 1	totaalscore dissociatie pretest - totaalscore dissociatie posttest	-5,938	4,837	1,209	-8,515	-3,360	-4,910	15	,000

T-test for uncertainty

Paired Samples Statistics

conditie			Mean	N	Std. Deviation	Std. Error Mean
niet staren	Pair 1	totaalscore onzekerheid pretest	63,19	16	68,304	17,076
		totaalscore onzekerheid posttest	52,62	16	43,775	10,944
7,5 seconden staren	Pair 1	totaalscore onzekerheid pretest	121,00	16	123,640	30,910
		totaalscore onzekerheid posttest	128,19	16	95,568	23,892
15 seconden staren	Pair 1	totaalscore onzekerheid pretest	86,25	16	72,866	18,216
		totaalscore onzekerheid posttest	161,38	16	87,600	21,900
30 seconden staren	Pair 1	totaalscore onzekerheid pretest	111,75	16	98,471	24,618
		totaalscore onzekerheid posttest	232,00	16	139,493	34,873
300 seconden staren	Pair 1	totaalscore onzekerheid pretest	121,31	16	117,740	29,435
		totaalscore onzekerheid posttest	266,06	16	118,905	29,726

Paired Samples Correlations

conditie			N	Correlation	Sig.
niet staren	Pair 1	totaalscore onzekerheid pretest & totaalscore onzekerheid posttest	16	,767	,001
7,5 seconden staren	Pair 1	totaalscore onzekerheid pretest & totaalscore onzekerheid posttest	16	,405	,119
15 seconden staren	Pair 1	totaalscore onzekerheid pretest & totaalscore onzekerheid posttest	16	,207	,442
30 seconden staren	Pair 1	totaalscore onzekerheid pretest & totaalscore onzekerheid posttest	16	,571	,021
300 seconden staren	Pair 1	totaalscore onzekerheid pretest & totaalscore onzekerheid posttest	16	-,261	,329

Paired Samples Test

conditie	Paired Differences					t	df	Sig. (2-tailed)		
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference						
				Lower	Upper					
niet staren	Pair 1	totaalscore onzekerheid pretest - totaalscore onzekerheid posttest	10,562	44,669	11,167	-13,240	34,365	,946	15	,359
7,5 seconden staren	Pair 1	totaalscore onzekerheid pretest - totaalscore onzekerheid posttest	-7,188	121,814	30,453	-72,097	57,722	-,236	15	,817
15 seconden staren	Pair 1	totaalscore onzekerheid pretest - totaalscore onzekerheid posttest	-75,125	101,691	25,423	-129,312	-20,938	-2,955	15	,010
30 seconden staren	Pair 1	totaalscore onzekerheid pretest - totaalscore onzekerheid posttest	-120,250	116,039	29,010	-182,083	-58,417	-4,145	15	,001
300 seconden staren	Pair 1	totaalscore onzekerheid pretest - totaalscore onzekerheid posttest	-144,750	187,889	46,972	-244,869	-44,631	-3,082	15	,008

Factor Analysis Dissociation

Component Matrix^a

	Component
	1
diss item 1, meting1	.699
diss item 2, meting1	-.194
diss item 3, meting 1	.735
diss item 4, meting 1	.459
diss item 5, meting 1	.813

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Component Matrix^a

	Component
	1
diss item 1, meting 2	.869
diss item 2, meting 2	.555
diss item 3, meting 2	.644
diss item 4, meting 2	.735
diss item 5, meting 2	.816

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Factor Analysis Uncertainty

Component Matrix^a

	Component
	1
onz item1, meting 1	.913
onz item 2, meting 1	.893
onz item3, meting 1	.866
onz item 4, meting 1	.719
onz item 5, meting 1	.789

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Component Matrix^a

	Component
	1
onz item 1, meting 2	.898
onz item2, meting 2	.925
onz item 3, meting 2	.903
onz item 4, meting 2	.697
onz item 5, meting 2	.826

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Factor Analysis Uncertainty And Dissociation

Component Matrix^a

	Component
	1
diss item 1, meting1	.648
diss item 2, meting1	-.030
diss item 3, meting 1	.382
diss item 4, meting 1	.270
diss item 5, meting 1	.657
onz item1, meting 1	.898
onz item 2, meting 1	.879
onz item3, meting 1	.833
onz item 4, meting 1	.665
onz item 5, meting 1	.735

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Component Matrix^a

	Component
	1
diss item 1, meting 2	.770
diss item 2, meting 2	.544
diss item 3, meting 2	.595
diss item 4, meting 2	.606
diss item 5, meting 2	.826
onz item 1, meting 2	.870
onz item2, meting 2	.916
onz item 3, meting 2	.887
onz item 4, meting 2	.620
onz item 5, meting 2	.788

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Correlations

Correlations

		totaalscore dissociatie pretest	totaalscore onzekerheid pretest
totaalscore dissociatie pretest	Pearson Correlation	1.000	.425**
	Sig. (2-tailed)		.000
	N	80.000	80
totaalscore onzekerheid pretest	Pearson Correlation	.425**	1.000
	Sig. (2-tailed)	.000	
	N	80	80.000

** . Correlation is significant at the 0.01 level (2-tailed).

Correlations

		totaalscore dissociatie posttest	totaalscore onzekerheid posttest
totaalscore dissociatie posttest	Pearson Correlation	1.000	.788**
	Sig. (2-tailed)		.000
	N	80.000	80
totaalscore onzekerheid posttest	Pearson Correlation	.788**	1.000
	Sig. (2-tailed)	.000	
	N	80	80.000

** . Correlation is significant at the 0.01 level (2-tailed).

Correlations

		verschilscore dissociatie pretest en posttest	verschilscore onzekerheid pretest en posttest
verschilscore dissociatie pretest en posttest	Pearson Correlation	1.000	.747**
	Sig. (2-tailed)		.000
	N	80.000	80
verschilscore onzekerheid pretest en posttest	Pearson Correlation	.747**	1.000
	Sig. (2-tailed)	.000	
	N	80	80.000

** . Correlation is significant at the 0.01 level (2-tailed).